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**COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION**

RECEIVED

In the Matter of:

JUL 07 2003

**AN INVESTIGATION OF EAST KENTUCKY
POWER COOPERATIVE, INC.'S NEED
FOR THE GILBERT UNIT AND THE
KENTUCKY PIONEER ENERGY, LLC
PURCHASE POWER AGREEMENT**

)
)
) **CASE NO. 2003-00030**
)
)

PUBLIC SERVICE
COMMISSION

**THE APPLICATION OF EAST KENTUCKY
POWER COOPERATIVE, INC. FOR
APPROVAL TO PURCHASE POWER
AGREEMENT**

)
) **CASE NO. 2000-00079**
)
)

**PREPARED TESTIMONY OF DAVID D. DRAKE
ON BEHALF OF
EAST KENTUCKY POWER COOPERATIVE, INC.**

Q. Please state your name and address.

A. My name is David D. Drake and my address is 3346 Pimlico Parkway, Lexington,
Kentucky.

Q. By whom are you employed and in what capacity?

A. I am employed by East Kentucky Power Cooperative, Inc. and I am the Manager of
Business Development and Non-Traditional Power Generation.

Q. Have you requested that Kentucky PioneerEnergy ("KPE") provide detailed
information about its efforts to address the June 2002 conclusions of East Kentucky's
consultant that additional development work is required to enable the coal
gasification technology to be applied in the manner envisioned by the KPE Project?

A. Upon receipt of this data request, East Kentucky Power asked KPE to provide an update of development work in light of the consultant's report. KPE's response is attached hereto as Drake Prepared Testimony Exhibit I.

Q. Does this conclude your testimony?

A. Yes.

2003-030-Drakeptest

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BEFORE THE PUBLIC SERVICE COMMISSION**

In the Matter of:

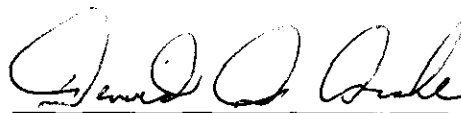
**AN INVESTIGATION OF EAST KENTUCKY)
POWER COOPERATIVE, INC.'S NEED)
FOR THE GILBERT UNIT AND THE) CASE NO. 2003-00030
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PURCHASE POWER AGREEMENT)**

**THE APPLICATION OF EAST KENTUCKY)
POWER COOPERATIVE, INC. FOR) CASE NO. 2000-00079
APPROVAL TO PURCHASE POWER)
AGREEMENT)**

AFFIDAVIT

**STATE OF KENTUCKY)
)
COUNTY OF CLARK)**

David D. Drake, being duly sworn, states that he has read the foregoing prepared testimony and that he would respond in the same manner to the questions if so asked upon taking the stand, and that the matters and things set forth therein are true and correct to the best of his knowledge, information and belief.



David D. Drake

Subscribed and sworn before me on this 7th day of July, 2003.



Notary Public

My Commission expires:

January 27, 2005



KENTUCKY PIONEER ENERGY, LLC

EKPC PROCEEDINGS BEFORE THE KY PUBLIC SERVICE COMMISSION

Gilbert Case: PSC Case No. 2003 – 00030
Purchase Power Case: PSC Case No. 2000 – 00079

KPE RESPONSE TO EKPC

Respondent and Witness: Dwight N. Lockwood

The Public Service Commission (PSC) issued the Order on June 13, 2003, in which Data Request item (e) requests:

“a detailed discussion of Kentucky Pioneer’s efforts to address the June 2002 conclusions of East Kentucky’s consultant that additional development work is required to enable the coal gasification technology to be applied in the manner envisioned by the Kentucky Pioneer project.”

In support of East Kentucky Power Cooperative (EKPC), Kentucky Pioneer Energy (KPE) has prepared the following response.

Introduction

Kentucky Pioneer evaluated the consultant’s report and had consultations with both EKPC and the consultant on the issues raised. KPE will continue to address the technical and operational issues raised, as it completes development of the project in consultation with British Gas Lurgi (BGL) in general and the process engineer, Lurgi Energie und Entsorgung (Lurgi).

Though BGL considers its technology fully commercial, the Kentucky Pioneer Project does represent the first application of the BGL fixed bed gasification technology in this country. This is why the Department of Energy is providing its “cost-share” funding. Because of this, KPE recognizes that it is appropriate to take a somewhat conservative approach to the plant design and operational planning. An example, reinforced by the consultant’s report, is that KPE has adjusted the project scope to provide 6-gasifiers instead of the four necessary for desired synthesis gas production. This will ensure appropriate additional capacity should throughput limitations occur, as well as providing appropriate redundancy and availability. Importantly too, it is noted that particular attention needs to be paid to the feed inlet lock-hopper system. KPE is confident that Lurgi has already addressed these issues in their “lessons learned” process and will incorporate them in their subsequent designs.

Before beginning the discussions below, an important point must be made that is essential to the understanding of the context of the consultant report, dated June 2002.

At the time of the visit, SVZ chose to operate the plant with significant limitations relative to design and expected capacity of the BGL itself. Some of these were by choice and some were dictated by necessity. This made the information available to the consultant and KPE of limited value as a predictor of normal operations as envisioned by KPE.

KPE understands that SVZ has increased production and commercial utilization of the BGL, since its sale and reorganization following the visit, to more closely reflect full capacity expectations. However, SVZ, in eastern Germany, is the product of a historically closed environment and public information availability has been limited to rather generic papers or newsletters. While SVZ had been operating their BGL on a commercial basis for over a year, though still testing it, Lurgi indicated their readiness to begin actively marketing the BGL in June 2002.

KPE believes the consultant report, especially in context of the necessary, as well as conscious, operating mode of the SVZ facility at the time of the visit, was more reflective of an "operational caution than technical deficiency" at the plant or in its design.

It is also important to appreciate that Lurgi has been an active participant in the SVZ installation, commissioning, operational qualification, and ongoing production. Again, Lurgi expects to implement lessons learned as each new project is undertaken, including KPE.

Discussion

To address the issues raised by the EKPC Consultant in his report, KPE provides discussion in several general areas that address the salient issues conveyed.

Experience and Technical Support

KPE will have a "License Agreement" with BGL. This provides process performance guarantees and liquidated damage protection for the project. Gas yield and quality are both specific components of the performance guarantees in the agreement. The License Agreement is the definitive basis of process expectation.

KPE will also have an "Engineering Service Agreement" with Lurgi that provides for: a) Lurgi design of the process; b) Lurgi design responsibility for, or input to, the associated balance of plant design; c) Lurgi support during construction in Trapp; and d) Lurgi support of start-up and extended operation after commercial operations begin. KPE will also seek to benefit from relevant experiences of SVZ during operational planning, and during early operations. Global Energy's own Westfield Development Centre in Scotland has relevant expertise in the BGL technology development that will benefit

KPE. Additionally, KPE anticipates ongoing consultative support from the EKPC's consultant to benefit from his extensive experience and expertise.

This provides KPE significant assurances concerning the availability of support and experience in the technology and its utilization.

Availability

A variety of circumstances affected the "reality" seen by the consultant during his visit. While his observations are helpful and worthy of serious deliberation for any gasification plant, their context does somewhat differentiate them from expected normal operations. KPE fully intends to reflect these comments and considerations in the plant design and operational planning as the project moves forward.

First, it is important to remember that the BGL unit at SVZ is only one of many gasifier and other processes at that location – all of which are integrated. SVZ had, at that time, neither the commercial demand nor the physical capability to operate the BGL at capacity on a sustained basis, and still operate the balance of their plant. Oxygen supply capacity in particular was not increased when the BGL was installed. Operating the BGL at capacity therefore precludes optimum operation of the facility – which is a less than desirable circumstance, relative to their commercial objectives.

The German government required various tests of the vessel and the process as part of initial certification. These necessarily caused the unit to experience "stops-and-starts" not associated with normal production operations. This does not imply that the unit is technically deficient or incapable of operating.

KPE understands from BGL, that the German government, in mandating closure of ALL landfills to organic waste beginning in 2004, and declaring gasification to be an essential "capacity alternative", sought to test the range of capabilities of the unit under the oversight of its own consultant (Prof. Meier). This "envelope testing" also impacted availability.

SVZ has found that certain menus of feedstock required different degrees of attention for effective process control. It also sought to explore various outlet pipe configurations in order to minimize particulate carryover. All of these tasks consume time and reflect adversely on "perceived" availability.

The Kentucky Pioneer Project will be designed specifically with the BGL at its core, and with full air separation unit capacity to supply necessary oxygen and nitrogen for all plant needs. Also, as noted above, KPE plans six gasifiers, instead of the basic four needed, to ensure desired capacity, reliability and availability.

RDF Pellet Experience

SVZ reportedly experienced various operational problems with RDF Pellets included in its feed menu. Even in their own view, these were generally “learning curve” issues, not significant process concerns.

- Stable and productive operations were and are always achieved by SVZ when they reverted to 100% coal.
- Pellet moisture needs to be minimized to assure pellet integrity during gasification. Moisture in the “below 10%” range was recommended. KPE had already established this as a specification parameter.
- Operation of the slag tap differs somewhat with RDF and coal than with coal by itself. These factors are understood and Lurgi is evolving the slag tap operation based on the SVZ experience. In essence, they will recommend appropriate slag tap operation, and flux utilization, depending on feed menu.
- RDF Pellet composition itself may vary from source to source or season to season. Uniformity of cargo batches is however more likely. Monitoring of feed material qualities upon receipt or use will facilitate process operation.
- Importantly too, KPE will provide synthesis gas sampling and analysis, as well as contemporaneous solid feedstock sampling – a) as a tool to monitor the process performance; and b) as an air permit requirement to supplement required stack testing.

Feedstock

KPE has always intended and planned a conservative approach to the start up of the plant. Operations will begin on 100% coal. RDF Pellet addition will begin as performance is established. Coal and RDF Pellet blend ratio will be changed as process performance warrants. RDF Pellet content will only be increased to the acceptable level for the process. While KPE does feel high RDF content is viable (SVZ has approached 100%) – high RDF content, such as 85% is not critical to the project economics. The DOE Demonstration targets a blend of only 50:50, and that is subject to process performance.

Technology

Some of the consultant's comments relate to synthesis gas and slag qualities.

Synthesis Gas

- SVZ's process limitations contribute to their gas composition, as it differs from expectation. Various testing modes may also have contributed to differences.
- Stable and continuous operation in a given mode, as KPE intends, will inherently result in consistent gas composition and quality, addressing some of these questions about composition. That is they are more related to process optimization considerations than ultimate gasification or IGCC performance concerns.
- The gas quality, reported by the consultant as a concern, is a function of feed composition and will be addressed, as noted above, during operational planning. Nitrogen is actually "added" to the fuel as a diluent, with carbon dioxide being an effective alternative. Methane, the primary compound of natural gas, is an acceptable fuel, as natural gas is intended as an alternate for synthesis gas. Therefore, the presence of these compounds in the product synthesis gas is not deleterious to the combustion turbine fuel.
- KPE will pursue these issues with Lurgi during design, but does not feel they are serious problems.
- Gas clean up downstream of the gasifiers will serve to ensure emissions themselves are as expected in the KPE permit issued by Kentucky Division of Air Quality.

Slag or Vitrified Frit

An important distinction must be made that was not clear in the consultant report. That is, slag produced by the BGL fixed bed technology is significantly different from that produced by entrained flow technologies. The BGL hearth zone is hotter and slag therefore more molten. This produces vitreous frit that has significantly less carbon, which in turn affects handling and use decisions. The fact that occasional iron oxide is visible in the slag will not materially alter the leaching qualities or qualification of the product slag.

BGL slag has been shown to pass the USEPA "Toxic Characteristic Leachate Procedure (TCLP)" test, including the more conservative Universal Treatment Standard (UTS) analytic criteria of the test. For clarity, though unrelated to this project, vitrified frit or slag from entrained flow gasification technologies has qualities that differ from BGL slag – but also passes these tests.

In the end, the slag will be managed as a commercial product and qualify as such within Kentucky regulations.

In Closing

KPE believes gasification and IGCC (Integrated Gasification Combined Cycle) will prove to be the next generation of coal based electric power production worldwide. The ability to:

- Clean the gas before use instead of scrubbing the exhaust gas;
- Lower, not raise, already low power prices in Kentucky;
- Capture and sequester carbon dioxide, as envisioned by FutureGen in Kentucky;
- Capture and cost-effectively remove mercury and other contaminants from fuel gas instead of scrubbing them from the exhaust gas; and
- Co-produce hydrogen or liquid motor fuels, as the next generation of fuel, **from coal** – as an alternative to oil production and refineries

Are all motivating and fostering development of IGCC technologies.

Kentucky Pioneer Energy believes RDF is a stepping-stone to a Kentucky Coal fed and IGCC based power generation economy in the Commonwealth in the 21st Century.

Dwight N. Lockwood

Dwight N. Lockwood, PE, QEP
Vice President, Regulatory Affairs

June 30, 2003